

REMARKS

The Office Action dated May 4, 2004, has been reviewed carefully and the application has been amended in a sincere effort to place the claims in condition for allowance.

Claim Rejections - 35 USC § 103

Claim 5 was rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 4, 810, 597 to Kumagai et al. ("Kumagai").

Claim 5 claims an aspect of the invention that involves sensing several fuel cell operating characteristics. The group of fuel cell operating characteristics include, as recited in the claim, potential across a load, potential across a portion of a fuel cell stack, potential at a portion of an anode of a fuel cell which is proximate to an end of a methanol flow path, an open circuit potential of said fuel cell, a short circuit current of said fuel cell. The claim includes the step of periodically sensing at least two of the operating characteristics of the group and then using those sensed operating characteristics to generate a signal that controls the concentration of methanol in the fuel cell.

This method is advantageous in instances in which a direct measurement of a single fuel cell operating characteristic may not provide the desired level of certainty as to the present concentration of methanol. Under such circumstances, it is advantageous to measure more than one operating characteristic of the fuel cell or fuel cell stack and, based on the combination of at least two measurements, the methanol concentration is

more precisely calculated and thereby controlled with greater certainty. More specifically, page 9 of the Specification, beginning at line 2 states:

For example, using the circuit of Figure 8, including device 82, the methods of Figure 4 (using potential across a load or a portion of a fuel cell stack) and Figure 9 (short circuit current) could be used together to control methanol concentration. Such combinations could provide redundancy or make possible more precise control of methanol concentration. (Emphasis added).

Kumagai, on the other hand, teaches measuring open circuit voltage and using that measurement to predict and thus control methanol concentration. (Kumagai, Col. 1, Lines 56 - Col. 2, Line 2). Specifically, as quoted by the Examiner, Kumagai teaches “when the open circuit voltage of the unit cell is sensed by the voltmeter 17, the compensation device 18 controls the concentration of methanol to be a predetermined value by the water feed valve 19 on the basis of the relationship between the open circuit voltage and the methanol concentration....” (Col. 3, Line 64 *et seq.*).

This is not anticipatory of claim 5. To be anticipated, each element of a claim must be shown in the prior art reference. However, Kumagai does not teach sensing more than one operating characteristic (for example, potential across a load driven by said fuel cell, potential across a portion of a fuel cell stack, potential at a portion of an anode of said fuel cell which is proximate to an end of a methanol flow path, and/or a short circuit current of said fuel cell). Furthermore Kumagai does not teach using at least two of the sensed operating characteristics to generate a control signal. Accord-

ingly, in view of the fact that Kumagai does not teach a number of the features which are set forth in claim 5, Kumagai cannot be said to have anticipated claim 5.

In order to further clarify the distinctions which claim 5 has over the cited reference, claim 5 has been amended herein to specifically recite the step of using at least two of the sensed operating characteristics to generate the control signal to control methanol concentration. In view of this, it is respectfully submitted that the claim is now in condition for allowance, and thus, reconsideration of the rejection is respectfully requested.

Double Patenting

Claim 5 was rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 6 of United States Patent No. 6,589,679 (the ‘679 patent). Although Applicant does not believe that current claim 5 and claim 6 of the ‘679 patent are substantively identical, the present application is a continuation-in-part application which is based upon the cited ‘679 patent and thus, in order to advance the prosecution of this application, a Terminal Disclaimer is being filed herewith.

Allowable Subject Matter

It is gratefully acknowledged that claims 1 and 2 have been allowed.

Summary

Claim 5 is the only claim rejected in the present application. The claim has been amended herein and based upon the foregoing argument, it is believed that the claim as amended is now in condition for allowance. All of the objections and rejections made by the Examiner have been addressed herein and therefore the application is now in condition for allowance.

Please do not hesitate to contact the undersigned in order to advance the prosecution of this application in any respect.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,


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